

Amendments to the Specification:

At page 6, please replace the paragraph beginning at line 12 with the following:

The "Cytotoxin Associated Immunodominant" (CAI) antigen refers to that protein, and fragments thereof, whose amino acid sequence is described in FIG. 4 and derivatives thereof. The CAI antigen is approximately 130 kDa as determined by SDS-PAGE and comprises the following amino acid sequence (SEQ ID NO:25):

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1   LysAsnGlyLysAsnLysAspPheSerLysValThrGlnAlaLysSerAspLeuGluAsn   20
21  SerValLysAspValIleIleAsnGlnLysValThrAspLysValAspAsnLeuAsnGln   40
41  AlaValSerValAlaLysAlaThrGlyAspPheSerArgValGluGlnAlaLeuAlaAsp   60
61  LeuLysAsnPheSerLysGluGlnLeuAlaGlnGlnAlaGlnLysAsnGluSerLeuAsn   80
81  AlaArgLysLysSerGluIleTyrGlnSerValLysAsnGlyValAsnGlyThrLeuVal  100
101 GlyAsnGlyLeuSerGlnAlaGluAlaThrThrLeuSerLysAsnPheSerAspIleLys  120
121 LysGluLeuAsnAlaLysLeuGlyAsnPheAsnAsnAsnAsnAsnGlyLeuLysAsn   140
141 GluProIleTyrAlaLysValAsnLysLysLysAlaGlyGlnAlaAlaSerLeuGluGlu  160
161 ProIleTyrAlaGlnValAlaLysLysValAsnAlaLysIleAspArgLeuAsnGlnIle  180
181 AlaSerGlyLeuGlyValValGlyGlnAlaAlaGlyPheProLeuLysArgHisAspLys  200
201 ValAspAspLeuSerLysValGlyLeuSerArgAsnGlnGluLeuAlaGlnLysIleAsp  220
221 AsnLeuAsnGlnAlaValSerGlu   228
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SEQ ID NO:25 is the expression product of the following cloned nucleotide sequence (SEQ ID NO:26, uppercase letters only) which entire fragment is cloned into an EcoRI site (EcoRI site in lowercase letters; the entire fragment is shown below as SEQ ID NO:27:

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1   gaattcAAAAATGGCAAAAATAAGGATTTTCAGCAAGGTAACGCAAGCAAAAAGCGACCTT   60
61  GAAATTCGTTAAAGATGTGATCATCAATCAAAGGTAACGGATAAAGTTGATAATCTC   120
121 AATCAAGCGGTATCAGTGGCTAAAGCAACGGGTGATTTTCAGTAGGGTAGAGCAAGCGTTA   180
181 GCCGATCTCAAAAATTTCTCAAAGGAGCAATTGGCCCAACAAGCTCAAAAAAATGAAAGT   240
241 CTCAATGCTAGAAAAAATCTGAAATATATCAATCCGTTAAGAATGGTGTGAATGGAACC   300
301 CTAGTCGGTAATGGGTTATCTCAAGCAGAAGCCACAACCTCTTTCTAAAAACTTTTCGGAC   360
361 ATCAAGAAAGAGTTGAATGCAAACTTGGAATTTCAATAACAATAACAATAATGGACTC   420
421 AAAACGAACCCATTTATGCTAAAGTTAATAAAAAGAAAGCAGGGCAAGCAGCTAGCCTT   480
481 GAAGAACCCATTTACGCTCAAGTTGCTAAAAAGGTAAATGCAAAAATTGACCGACTCAAT   540
541 CAAATAGCAAGTGGTTTGGGTGTTGTAGGGCAAGCAGCGGGCTTCCCTTTGAAAAGGCAT   600
601 GATAAAGTTGATGATCTCAGTAAGGTAGGGCTTTCAAGGAATCAAGAATTGGCTCAGAAA   660
661 ATTGACAATCTCAATCAAGCGGTATCAGAAGccgaattc   699
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This is an hydrophilic, surface-exposed protein having a molecular weight of approximately 120-132 kDa, preferably 128-130 kDa, produced by clinical isolates. The size of the gene and of the encoded protein varies in different strains by a mechanism that involves duplication of regions internal to the gene. The clinical isolates that do not produce the CAI antigen, do not have the cai gene, and are also unable to produce an active cytotoxin. The association between the presence of the cai gene and cytotoxicity suggests that the product of the cai gene is necessary for the transcription, folding, export or function of the cytotoxin. Alternatively, both the cytotoxin (CT) and the cai gene are absent in noncytotoxic strains. This would imply some physical linkage between the two genes. A peculiar property of the CAI antigen is the size variability, suggesting that the cai gene is continuously changing. The CAI antigen appears to be associated to the cell surface. This suggests that the release of the antigen in the supernatant may be due to the action of proteases present in the serum that may cleave either the antigen itself, or the complexes that hold the CAI antigen associated to the bacterial surface. Similar processing activities may release the antigen during in vivo growth. The absence of a typical leader peptide sequence suggests the presence of an independent export system.